Handy Scientific Data

PHYSICS

RELATIONS BETWEEN COMMON UNITS

LENGTH

1 in. = 2.540 cm.
1 ft. = 30.48 cm.
1 micron (μ) = 0.000001 m = 0.001 mm. = 10^{-4} cm.
1 millionth micron ($\mu\mu$) = 10^{-10}
1 Angström unit = 10^{-8} cm.

VOLUME

1 liter = 1000 cc. = 61.024 in.^{3} = 1.05671 qt.

MASS

1 lb. = 453.59 gr.
1 kg. = 2.2046 lb.

ANGLES

1 circumference = 360° = 2π radians.
1 radian = 57.2958°.

DENSITY

1 gr./cm.^{3} = 62.4 lb./ft.^{3}

PRESSURE

1 atmosphere = 76 cm. of mercury = 14.697 lb./in.^{2}.
= 1013200 dynes/cm.^{2}

WORK OR ENERGY

1 ft.-lb. = 1.356 × 10^7 ergs.
1 joule = 10^7 ergs.
1 gr. cal. = 4.186 × 10^7 ergs.
1 B.T.U. = 777.8 ft.-lb. = 252.2 gr. cal.

POWER

1 H.P. = 33,000 ft. lb./min.
= 550 ft. lb./sec. = 746 watts.
1 watt = 1 joule/sec.

ELECTRICAL UNITS

1 ampere = 10^{-1} ab-amps = 3 × 10^9 E.S.U.
1 volt = 10^8 E.M.U. = ⅓ × 10^{-2} E.S.U.
1 coulomb = 10^{-1} E.M.U. = 3 × 10^9 E.S.U.
1 ohm = 10^9 E.M.U. = ⅑ × 10^{-11} E.S.U.
1 farad = 10^{-9} E.M.U. = 9 × 10^{11} E.S.U.
1 henry = 10^9 E.M.U. = ⅑ × 10^{-11} E.S.U.

FORMULAS

· Composition of Forces

The resultant of two forces acting at an angle upon a given point is equal to the diagonal of a parallelogram of which the two force vectors are sides. The equilibrant equals the magnitude of the resultant, but acts in the opposite direction.

· Accelerated Motion

$$v = at, \text{ or } v = gt$$

v is final velocity; a is acceleration, or g is acceleration due to gravity; t is time.

· Accelerated Motion

$$s = \tfrac{1}{2}at^2, \text{ or } s = \tfrac{1}{2}gt^2$$

s is total distance; a is acceleration, or g is acceleration due to gravity; t is time.

· Accelerated Motion

$$v = \sqrt{2as}, \text{ or } v = \sqrt{2gs}$$

v is final velocity; a is acceleration, or g is acceleration due to gravity; s is total distance.

· Newton's Second Law of Motion

$$F = ma$$

F is force; m is mass; a is acceleration.

· Impulse and Momentum

$$Ft = mv$$

F is force; t is time; the product Ft is impulse; m is mass; v is velocity; the product mv is momentum.

· Centrifugal Force

$$\text{Centrifugal Force} = \frac{mv^2}{r}$$

m is mass; v is velocity; r is radius of path.

· Work

$$W = Fs$$

W is work; F is force; s is distance.

· Potential Energy

$$\text{P.E.} = mgh$$

P.E. is potential energy; m is mass; g is acceleration due to gravity; h is vertical distance.

· Kinetic Energy

$$\text{K.E.} = \tfrac{1}{2}mv^2$$

K.E. is kinetic energy; m is mass; v is velocity.

PHYSICAL CONSTANTS

c	Velocity of light	2.9978 × 10^{10} cm./sec.
G	Gravitation constant	6.66 × 10^{-8} cm.^{3} gr.$^{-1}$ sec.$^{-2}$
e	Electronic charge	4.803 × 10^{-10} E.S.U.
		1.601 × 10^{-20} E.M.U.
e/m_o	Electronic ratio	5.275 × 10^{17} E.S.U./gr.
		1.759 × 10^7 E.M.U./gr.
F	Faraday	9.6500 × 10^4 coulombs
v_o	Vol. of 1 gr. mol. at 0° C. and 1 atm.	22.4115 liters/gr. mol.
h	Planck's constant	6.626 × 10^{-27} erg sec.
R	Gas constant	8.315 × 10^7 ergs/° C. gr. mol.
N_o	Avogadro's number	6.061 × 10^{23}/gr. mol.
M_H	Mass of hydrogen atom	1.663 × 10^{-24} gr.
m_o	Electronic mass	9.111 × 10^{-28} gr.

1 Gram-calorie = 4.186 joules.
1 British thermal unit = 1054.8 joules.

CHEMISTRY

SYMBOLS OF SOME PARTICLES

electron	$_{-1}e^0$	deuteron	$_1H^2$
neutron	$_0n^1$	triton	$_1H^3$
proton	$_1H^1$	alpha particle	$_2He^4$

OXIDATION STATE OF SOME RADICALS

CH_3COO^-	ClO_4^-	$H_2PO_4^-$	NO_3^-
$CO_3^=$	$Cr_2O_7^=$	H_3O^+	OH^-
$C_2O_4^=$	HCO_3^-	Hg_2^{++}	$PO_3^{\equiv}$
ClO^-	$HPO_4^=$	MnO_4^-	$PO_4^{\equiv}$
ClO_2^-	HSO_3^-	NH_4^+	$SO_3^=$
ClO_3^-	HSO_4^-	NO_2^-	$SO_4^=$

PERIODIC TABLE OF THE ELEMENTS

Atomic weights conform to the 1961 values of the Commission on Atomic Weights.

KEY
Atomic Mass (Weight)—12.01115
Symbol—C
Atomic Number—6

GROUPS

Transition Elements

Period	IA	IIA	IIIB	IVB	VB	VIB	VIIB	VIII			IB	IIB	IIIA	IVA	VA	VIA	VIIA	0
1	1.00797 H 1																1.00797 H 1	4.0026 He 2
2	6.939 Li 3	9.0122 Be 4											10.811 B 5	12.01115 C 6	14.0067 N 7	15.9994 O 8	18.9984 F 9	20.183 Ne 10
3	22.9898 Na 11	24.312 Mg 12											26.9815 Al 13	28.086 Si 14	30.9738 P 15	32.064 S 16	35.453 Cl 17	39.948 Ar 18
4	39.102 K 19	40.08 Ca 20	44.956 Sc 21	47.90 Ti 22	50.942 V 23	51.996 Cr 24	54.9380 Mn 25	55.847 Fe 26	58.9332 Co 27	58.71 Ni 28	63.54 Cu 29	65.37 Zn 30	69.72 Ga 31	72.59 Ge 32	74.9216 As 33	78.96 Se 34	79.909 Br 35	83.80 Kr 36
5	85.47 Rb 37	87.62 Sr 38	88.905 Y 39	91.22 Zr 40	92.906 Nb 41	95.94 Mo 42	(99) Tc 43	101.07 Ru 44	102.905 Rh 45	106.4 Pd 46	107.870 Ag 47	112.40 Cd 48	114.82 In 49	118.69 Sn 50	121.75 Sb 51	127.60 Te 52	126.9044 I 53	131.30 Xe 54
6	132.905 Cs 55	137.34 Ba 56	138.91 La 57	178.49 Hf 72	180.948 Ta 73	183.85 W 74	186.2 Re 75	190.2 Os 76	192.2 Ir 77	195.09 Pt 78	196.967 Au 79	200.59 Hg 80	204.37 Tl 81	207.19 Pb 82	208.980 Bi 83	(210) Po 84	(210) At 85	(222) Rn 86
7	(223) Fr 87	(226) Ra 88	(227) Ac 89															

Lanthanide Series

140.12 Ce 58	140.907 Pr 59	144.24 Nd 60	(147) Pm 61	150.35 Sm 62	151.96 Eu 63	157.25 Gd 64	158.924 Tb 65	162.50 Dy 66	164.930 Ho 67	167.26 Er 68	168.934 Tm 69	173.04 Yb 70	174.97 Lu 71

Actinide Series

232.038 Th 90	(231) Pa 91	238.03 U 92	(237) Np 93	(242) Pu 94	(243) Am 95	(247) Cm 96	(247) Bk 97	(249) Cf 98	(254) Es 99	(253) Fm 100	(256) Md 101	(254) No 102	(257) Lw 103

Numbers in parentheses are mass numbers of most stable or most common isotope.

STANDARD OXIDATION POTENTIALS

Ionic Concentrations 1 molal in water at 25°C

Half cell Reaction	E° (volts)
$Li = Li^+ + e^-$	3.05
$Rb = Rb^+ + e^-$	2.93
$K = K^+ + e^-$	2.93
$Cs = Cs^+ + e^-$	2.92
$Ba = Ba^{++} + 2e^-$	2.90
$Sr = Sr^{++} + 2e^-$	2.89
$Ca = Ca^{++} + 2e^-$	2.87
$Na = Na^+ + e^-$	2.71
$Mg = Mg^{++} + 2e^-$	2.37
$Be = Be^{++} + 2e^-$	1.85
$Al = Al^{+++} + 3e^-$	1.66
$Mn = Mn^{++} + 2e^-$	1.18
$Zn = Zn^{++} + 2e^-$	0.76
$Cr = Cr^{+++} + 3e^-$	0.74
$Fe = Fe^{++} + 2e^-$	0.44
$Cd = Cd^{++} + 2e^-$	0.40
$Co = Co^{++} + 2e^-$	0.28
$Ni = Ni^{++} + 2e^-$	0.25
$Sn = Sn^{++} + 2e^-$	0.14
$Pb = Pb^{++} + 2e^-$	0.13
$H_2 = 2H^+ + 2e^-$	0.00
$Sn^{++} = Sn^{++++} + 2e^-$	−0.15
$Cu^+ = Cu^{++} + e^-$	−0.15
$Cu = Cu^{++} + 2e^-$	−0.34
$2I^- = I_2 + 2e^-$	−0.53
$Fe^{++} = Fe^{+++} + e^-$	−0.77
$2Hg = Hg_2^{++} + 2e^-$	−0.79
$Ag = Ag^+ + e^-$	−0.80
$Hg_2^{++} = 2Hg^{++} + 2e^-$	−0.92
$2Br^- = Br_2(l) + 2e^-$	−1.07
$NO + 2H_2O = NO_3^- + 4H^+ + 4e^-$	−0.96
$2H_2O = O_2 + 4H^+ + 4e^-$	−1.23
$2\,Cr^{+++} + 7H_2O = Cr_2O_7^{--} + 14H^+ + 6e^-$	−1.33
$2Cl^- = Cl_2 + 2e^-$	−1.36
$Au = Au^{+++} + 3e^-$	−1.50
$Mn^{+2} + 4H_2O = MnO_4^- + 8H^+ + 5e^-$	−1.51
$2F^- = F_2 + 2e^-$	−2.87

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Airmen

The first step is to visit your Air Force recruiter. If you decide to enlist, you'll receive excellent training in a vital aerospace specialty. Both men and women are eligible for Air Force enlistment.

Air Force ROTC

There are units on 186 college and university campuses in the U. S. and Puerto Rico. It's a fine way to receive your officer's commission at the same time as your college degree.

Air Force Academy

This is one of the country's greatest educational institutions. A limited number of places are available, mainly through congressional nomination. Ask your Air Force recruiter how to apply.

Air Force OTS

Officer Training School is a three-month course, open to men and women college graduates, that leads to a lieutenant's commission. You may apply if you have, or are within 210 days of, your college degree.

CGS 65-14. ☆ GPO : 1965 O—764-941

MATHEMATICS

COMMON LOGARITHMS OF NUMBERS*

N	0	1	2	3	4	5	6	7	8	9
10	0000	0043	0086	0128	0170	0212	0253	0294	0334	0374
11	0414	0453	0492	0531	0569	0607	0645	0682	0719	0755
12	0792	0828	0864	0899	0934	0969	1004	1038	1072	1106
13	1139	1173	1206	1239	1271	1303	1335	1367	1399	1430
14	1461	1492	1523	1553	1584	1614	1644	1673	1703	1732
15	1761	1790	1818	1847	1875	1903	1931	1959	1987	2014
16	2041	2068	2095	2122	2148	2175	2201	2227	2253	2279
17	2304	2330	2355	2380	2405	2430	2455	2480	2504	2529
18	2553	2577	2601	2625	2648	2672	2695	2718	2742	2765
19	2788	2810	2833	2856	2878	2900	2923	2945	2967	2989
20	3010	3032	3054	3075	3096	3118	3139	3160	3181	3201
21	3222	3243	3263	3284	3304	3324	3345	3365	3385	3404
22	3424	3444	3464	3483	3502	3522	3541	3560	3579	3598
23	3617	3636	3655	3674	3692	3711	3729	3747	3766	3784
24	3802	3820	3838	3856	3874	3892	3909	3927	3945	3962
25	3979	3997	4014	4031	4048	4065	4082	4099	4116	4133
26	4150	4166	4183	4200	4216	4232	4249	4265	4281	4298
27	4314	4330	4346	4362	4378	4393	4409	4425	4440	4456
28	4472	4487	4502	4518	4533	4548	4564	4579	4594	4609
29	4624	4639	4654	4669	4683	4698	4713	4728	4742	4757
30	4771	4786	4800	4814	4829	4843	4857	4871	4886	4900
31	4914	4928	4942	4955	4969	4983	4997	5011	5024	5038
32	5051	5065	5079	5092	5105	5119	5132	5145	5159	5172
33	5185	5198	5211	5224	5237	5250	5263	5276	5289	5302
34	5315	5328	5340	5353	5366	5378	5391	5403	5416	5428
35	5441	5453	5465	5478	5490	5502	5514	5527	5539	5551
36	5563	5575	5587	5599	5611	5623	5635	5647	5658	5670
37	5682	5694	5705	5717	5729	5740	5752	5763	5775	5786
38	5798	5809	5821	5832	5843	5855	5866	5877	5888	5899
39	5911	5922	5933	5944	5955	5966	5977	5988	5999	6010
40	6021	6031	6042	6053	6064	6075	6085	6096	6107	6117
41	6128	6138	6149	6160	6170	6180	6191	6201	6212	6222
42	6232	6243	6253	6263	6274	6284	6294	6304	6314	6325
43	6335	6345	6355	6365	6375	6385	6395	6405	6415	6425
44	6435	6444	6454	6464	6474	6484	6493	6503	6513	6522
45	6532	6542	6551	6561	6571	6580	6590	6599	6609	6618
46	6628	6637	6646	6656	6665	6675	6684	6693	6702	6712
47	6721	6730	6739	6749	6758	6767	6776	6785	6794	6803
48	6812	6821	6830	6839	6848	6857	6866	6875	6884	6893
49	6902	6911	6920	6928	6937	6946	6955	6964	6972	6981
50	6990	6998	7007	7016	7024	7033	7042	7050	7059	7067
51	7076	7084	7093	7101	7110	7118	7126	7135	7143	7152
52	7160	7168	7177	7185	7193	7202	7210	7218	7226	7235
53	7243	7251	7259	7267	7275	7284	7292	7300	7308	7316
54	7324	7332	7340	7348	7356	7364	7372	7380	7388	7396
55	7404	7412	7419	7427	7435	7443	7451	7459	7466	7474
56	7482	7490	7497	7505	7513	7520	7528	7536	7543	7551
57	7559	7566	7574	7582	7589	7597	7604	7612	7619	7627
58	7634	7642	7649	7657	7664	7672	7679	7686	7694	7701
59	7709	7716	7723	7731	7738	7745	7752	7760	7767	7774
60	7782	7789	7796	7803	7810	7818	7825	7832	7839	7846
61	7853	7860	7868	7875	7882	7889	7896	7903	7910	7917
62	7924	7931	7938	7945	7952	7959	7966	7973	7980	7987
63	7993	8000	8007	8014	8021	8028	8035	8041	8048	8055
64	8062	8069	8075	8082	8089	8096	8102	8109	8116	8122
65	8129	8136	8142	8149	8156	8162	8169	8176	8182	8189
66	8195	8202	8209	8215	8222	8228	8235	8241	8248	8254
67	8261	8267	8274	8280	8287	8293	8299	8306	8312	8319
68	8325	8331	8338	8344	8351	8357	8363	8370	8376	8382
69	8388	8395	8401	8407	8414	8420	8426	8432	8439	8445
70	8451	8457	8463	8470	8476	8482	8488	8494	8500	8506
71	8513	8519	8525	8531	8537	8543	8549	8555	8561	8567
72	8573	8579	8585	8591	8597	8603	8609	8615	8621	8627
73	8633	8639	8645	8651	8657	8663	8669	8675	8681	8686
74	8692	8698	8704	8710	8716	8722	8727	8733	8739	8745
75	8751	8756	8762	8768	8774	8779	8785	8791	8797	8802
76	8808	8814	8820	8825	8831	8837	8842	8848	8854	8859
77	8865	8871	8876	8882	8887	8893	8899	8904	8910	8915
78	8921	8927	8932	8938	8943	8949	8954	8960	8965	8971
79	8976	8982	8987	8993	8998	9004	9009	9015	9020	9025
80	9031	9036	9042	9047	9053	9058	9063	9069	9074	9079
81	9085	9090	9096	9101	9106	9112	9117	9122	9128	9133
82	9138	9143	9149	9154	9159	9165	9170	9175	9180	9186
83	9191	9196	9201	9206	9212	9217	9222	9227	9232	9238
84	9243	9248	9253	9258	9263	9269	9274	9279	9284	9289
85	9294	9299	9304	9309	9315	9320	9325	9330	9335	9340
86	9345	9350	9355	9360	9365	9370	9375	9380	9385	9390
87	9395	9400	9405	9410	9415	9420	9425	9430	9435	9440
88	9445	9450	9455	9460	9465	9469	9474	9479	9484	9489
89	9494	9499	9504	9509	9513	9518	9523	9528	9533	9538
90	9542	9547	9552	9557	9562	9566	9571	9576	9581	9586
91	9590	9595	9600	9605	9609	9614	9619	9624	9628	9633
92	9638	9643	9647	9652	9657	9661	9666	9671	9675	9680
93	9685	9689	9694	9699	9703	9708	9713	9717	9722	9727
94	9731	9736	9741	9745	9750	9754	9759	9763	9768	9773
95	9777	9782	9786	9791	9795	9800	9805	9809	9814	9818
96	9823	9827	9832	9836	9841	9845	9850	9854	9859	9863
97	9868	9872	9877	9881	9886	9890	9894	9899	9903	9908
98	9912	9917	9921	9926	9930	9934	9939	9943	9948	9952
99	9956	9961	9965	9969	9974	9978	9983	9987	9991	9996
N	0	1	2	3	4	5	6	7	8	9

*This table gives the mantissas of numbers with the decimal point omitted in each case. Characteristics are determined by inspection from the numbers.

VALUES OF TRIGONOMETRIC FUNCTIONS

Sines, Cosines, and Tangents of Angles from 1 to 90 Degrees

Angle	Sine	Cosine	Tangent	Angle	Sine	Cosine	Tangent	Angle	Sine	Cosine	Tangent
1°	.0175	.9998	.0175	31°	.5150	.8572	.6009	61°	.8746	.4848	1.8040
2°	.0349	.9994	.0349	32°	.5299	.8480	.6249	62°	.8829	.4695	1.8807
3°	.0523	.9986	.0524	33°	.5446	.8387	.6494	63°	.8910	.4540	1.9626
4°	.0698	.9976	.0699	34°	.5592	.8290	.6745	64°	.8988	.4384	2.0503
5°	.0872	.9962	.0875	35°	.5736	.8192	.7002	65°	.9063	.4226	2.1445
6°	.1045	.9945	.1051	36°	.5878	.8090	.7265	66°	.9135	.4067	2.2460
7°	.1219	.9925	.1228	37°	.6018	.7986	.7536	67°	.9205	.3907	2.3559
8°	.1392	.9903	.1405	38°	.6157	.7880	.7813	68°	.9272	.3746	2.4751
9°	.1564	.9877	.1584	39°	.6293	.7771	.8098	69°	.9336	.3584	2.6051
10°	.1736	.9848	.1763	40°	.6428	.7660	.8391	70°	.9397	.3420	2.7475
11°	.1908	.9816	.1944	41°	.6561	.7547	.8693	71°	.9455	.3256	2.9042
12°	.2079	.9781	.2126	42°	.6691	.7431	.9004	72°	.9511	.3090	3.0777
13°	.2250	.9744	.2309	43°	.6820	.7314	.9325	73°	.9563	.2924	3.2709
14°	.2419	.9703	.2493	44°	.6947	.7193	.9657	74°	.9613	.2756	3.4874
15°	.2588	.9659	.2679	45°	.7071	.7071	1.0000	75°	.9659	.2588	3.7321
16°	.2756	.9613	.2867	46°	.7193	.6947	1.0355	76°	.9703	.2419	4.0108
17°	.2924	.9563	.3057	47°	.7314	.6820	1.0724	77°	.9744	.2250	4.3315
18°	.3090	.9511	.3249	48°	.7431	.6691	1.1106	78°	.9781	.2079	4.7046
19°	.3256	.9455	.3443	49°	.7547	.6561	1.1504	79°	.9816	.1908	5.1446
20°	.3420	.9397	.3640	50°	.7660	.6428	1.1918	80°	.9848	.1736	5.6713
21°	.3584	.9336	.3839	51°	.7771	.6293	1.2349	81°	.9877	.1564	6.3138
22°	.3746	.9272	.4040	52°	.7880	.6157	1.2799	82°	.9903	.1392	7.1154
23°	.3907	.9205	.4245	53°	.7986	.6018	1.3270	83°	.9925	.1219	8.1443
24°	.4067	.9135	.4452	54°	.8090	.5878	1.3764	84°	.9945	.1045	9.5144
25°	.4226	.9063	.4663	55°	.8192	.5736	1.4281	85°	.9962	.0872	11.4301
26°	.4384	.8988	.4877	56°	.8290	.5592	1.4826	86°	.9976	.0698	14.3007
27°	.4540	.8910	.5095	57°	.8387	.5446	1.5399	87°	.9986	.0523	19.0811
28°	.4695	.8829	.5317	58°	.8480	.5299	1.6003	88°	.9994	.0349	28.6363
29°	.4848	.8746	.5543	59°	.8572	.5150	1.6643	89°	.9998	.0175	57.2900
30°	.5000	.8660	.5774	60°	.8660	.5000	1.7321	90°	1.0000	.0000	

FORMULAS FOR READY REFERENCE

Perimeter		Area		Volume	
scalene ▲	$P = a + b + c$	**rectangle**	$A = lw$	**cylinder**	$V = Bh$
isosceles ▲	$P = 2a + b$	**square**	$A = lw$ or $A = s^2$	**rectangular solid**	$V = lwh$
equilateral ▲	$P = 3s$	**parallelogram**	$A = bh$	**cube**	$V = e^3$
quadrilateral	$P = a + b + c + d$	**triangle**	$A = \frac{1}{2}bh$	**circular cylinder**	$V = \pi r^2 h$
rectangle	$P = 2l + 2w$	**trapezoid**	$A = \frac{1}{2}h\,(b_1 + b_2)$	**pyramid**	$V = \frac{1}{3}Bh$
square	$P = 4s$	**circle**	$A = \pi r^2$	**cone**	$V = \frac{1}{3}Bh$ or $\frac{1}{3}\pi r^2 h$
circle	$C = \pi d$ or $C = 2\pi r$	**cube**	$A_2 = 6e^2$	**sphere**	$V = \frac{4}{3}\pi r^3$ or $\frac{4\pi r^3}{3}$

Distance = rate × time, $d = rt$
Interest = Principal × Rate × Time, $I = P \cdot R \cdot T$

General quadratic equation: $ax^2 + bx + c = 0$
Quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Handy Scientific Data

TABLE OF SQUARE ROOTS

No.	Square	Square Root	No.	Square	Square Root
1	1	1.00	76	5,776	8.72
2	4	1.41	77	5,929	8.77
3	9	1.73	78	6,084	8.83
4	16	2.	79	6,241	8.89
5	25	2.24	80	6,400	8.94
6	36	2.45	81	6,561	9.
7	49	2.65	82	6,724	9.06
8	64	2.83	83	6,889	9.11
9	81	3.	84	7,056	9.17
10	100	3.16	85	7,225	9.22
11	121	3.32	86	7,396	9.27
12	144	3.46	87	7,569	9.33
13	169	3.61	88	7,744	9.38
14	196	3.74	89	7,921	9.43
15	225	3.87	90	8,100	9.49
16	256	4.	91	8,281	9.54
17	289	4.12	92	8,464	9.59
18	324	4.24	93	8,649	9.64
19	361	4.36	94	8,836	9.70
20	400	4.47	95	9,025	9.75
21	441	4.58	96	9,216	9.80
22	484	4.69	97	9,409	9.85
23	529	4.80	98	9,604	9.90
24	576	4.90	99	9,801	9.95
25	625	5.	100	10,000	10.
26	676	5.10	101	10,201	10.05
27	729	5.20	102	10,404	10.10
28	784	5.29	103	10,609	10.15
29	841	5.39	104	10,816	10.20
30	900	5.48	105	11,025	10.25
31	961	5.57	106	11,236	10.30
32	1,024	5.66	107	11,449	10.34
33	1,089	5.74	108	11,664	10.39
34	1,156	5.83	109	11,881	10.44
35	1,225	5.92	110	12,100	10.49
36	1,296	6.	111	12,321	10.54
37	1,369	6.08	112	12,544	10.58
38	1,444	6.16	113	12,769	10.63
39	1,521	6.24	114	12,996	10.68
40	1,600	6.32	115	13,225	10.72
41	1,681	6.40	116	13,456	10.77
42	1,764	6.48	117	13,689	10.82
43	1,849	6.56	118	13,924	10.86
44	1,936	6.63	119	14,161	10.91
45	2,025	6.71	120	14,400	10.95
46	2,116	6.78	121	14,641	11.
47	2,209	6.86	122	14,884	11.05
48	2,304	6.93	123	15,129	11.09
49	2,401	7.	124	15,376	11.14
50	2,500	7.07	125	15,625	11.18
51	2,601	7.14	126	15,876	11.22
52	2,704	7.21	127	16,129	11.27
53	2,809	7.28	128	16,384	11.31
54	2,916	7.35	129	16,641	11.36
55	3,025	7.42	130	16,900	11.40
56	3,136	7.48	131	17,161	11.45
57	3,249	7.55	132	17,424	11.49
58	3,364	7.62	133	17,689	11.53
59	3,481	7.68	134	17,956	11.58
60	3,600	7.75	135	18,225	11.62
61	3,721	7.81	136	18,496	11.66
62	3,844	7.87	137	18,769	11.70
63	3,969	7.94	138	19,044	11.75
64	4,096	8.	139	19,321	11.79
65	4,225	8.06	140	19,600	11.83
66	4,356	8.12	141	19,881	11.87
67	4,489	8.19	142	20,164	11.92
68	4,624	8.25	143	20,449	11.96
69	4,761	8.31	144	20,736	12.
70	4,900	8.37	145	21,025	12.04
71	5,041	8.43	146	21,316	12.08
72	5,184	8.49	147	21,609	12.12
73	5,329	8.54	148	21,904	12.17
74	5,476	8.60	149	22,201	12.21
75	5,625	8.66	150	22,500	12.25

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